

**REMARKS**

Claims 1-28 are currently pending in the application. Applicants respectfully request consideration of the following Remarks.

**REJECTIONS UNDER 35 U.S.C. § 103(a)**

The Office Action has rejected claims 1-28 under 35 U.S.C. § 103(a), as allegedly being obvious over U.S. Patent No. 6,580,224 to Ishii et al. (hereinafter “Ishii”) in view of U.S. Patent Publication No. 2003/0020101 to Bogner et al. (hereinafter “Bogner”) and “Development and Luminescent Characteristics of CaSiN<sub>2</sub> Based Phosphors,” Journal of the Institute of Electronic Engineering of Korea, Oct. 1999 by Lee et al. (hereinafter “Lee”). Applicants respectfully disagree for the following reasons.

As an initial matter, the current Office Action alleges that the prior response only addressed the cited references individually and not in combination. Applicants disagree as the motivation or suggestion to combine such references was discussed in addition to discussing the teachings of the cited references individually.

The current Office Action incorrectly states that Ishii teaches an electroluminescent backlight comprising “a blue or blue-green copper activated zinc sulfate electroluminescent phosphor mixed with a red fluorescent phosphor”. In the prior response, Applicants pointed out that Ishii utilizes a red emitting fluorescent pigment which is a fluorone dye. The fluorescent pigment is not a phosphor and there is no motivation or suggestion to substitute this dye with a europium activated alkaline earth silicon nitride phosphor.

Thus, the Office Action alleges that the present invention is a mere substitution of one of the *phosphors* in Ishii with a phosphor described in Bogner or Lee (emphasis added to erroneous use of phosphor). This is incorrect.

Further, Ishii describes the red fluorescent pigment as inferior in luminous efficiency to the copper activated zinc sulfide phosphor. Ishii fails to teach or suggest either a red emitting phosphor or a blend of phosphor materials to achieve a white emission.

Moreover, in the present application (see paragraph 0005), Applicants describe the combination of a blue-green emitting electroluminescent phosphor and a Rhodamine dye, similar

to that described in Ishii. As described in the same paragraph, this combination produces an undesirable pink color emission. Ishii does not teach or suggest a blend of phosphors or the use of a europium activated alkaline earth silicon nitride phosphor, and one of skill in the art would not have been motivated, based on Ishii, to substitute the rhodamine pigment of Ishii with a europium activated alkaline earth silicon nitride phosphor.

Bogner, as described in the prior response, is directed to light emitting diodes (LEDs) and phosphors for use with LEDs. LEDs are solid state devices that do not use the electroluminescent (EL) phosphors found in electroluminescent lamps. Instead, LEDs use a doped p-n junction that can emit light upon application of a low voltage, direct current. For clarification, an EL phosphor would not be sufficiently stimulated by the emission of an LED. Bogner uses a photoluminescent rare-earth activated silicon nitride phosphor to convert a portion of the light emitted by the LED to another color. Bogner fails to teach or suggest a blend of an EL phosphor and a photoluminescent phosphor. In addition, the Office Action simply states that Bogner “further appreciates the use of said europium activated alkaline earth silicon nitride materials in electroluminescent devices”, but only references a background art paragraph of Bogner that describes, for example, “Photoluminescence Characterization of  $\text{Mg}_{1-x}\text{Zn}_x\text{SiN}_2\text{:Tb}$  for Thin Film Electroluminescent Devices Application”. In fact, such a combination would be detrimental to the application of Bogner, as the blending of an EL phosphor with a photoluminescent phosphor would reduce light output from the LED because the EL phosphor would not be stimulated to emit light by the blue photons emitted by the LED.

Lee discloses a  $\text{CaSiN}_2\text{:Eu}$  phosphor, but Lee apparently fails to teach or suggest a blend of phosphors, such as a combination of an EL phosphor, for example, a blue or blue green emitting EL, and a europium activated alkaline earth silicon nitride phosphor.

Thus, the rejection relies on the substitution of Ishii’s rhodamine dye pigment with a europium activated alkaline earth silicon nitride phosphor. None of the references teach or suggest a blend of an EL phosphor and a europium activated alkaline earth silicon nitride phosphor. With respect to the combination of references, to combine Ishii and Bogner, one would have to first substitute the rhodamine dye pigment with a europium activated alkaline earth silicon nitride phosphor. This is not contemplated or suggested in Ishii, and ignores the fact that Bogner uses an LED instead of an EL phosphor. Similarly, the combination with Lee

would require the substitution of the rhodamine dye pigment with the europium activated phosphor.

Specifically, there is no suggestion to motivate one of skill in the art to modify the teaching of Ishii to replace the rhodamine group fluorescent pigment with a red emitting europium activated alkaline earth silicon nitride phosphor, or to create any blend of phosphor materials that would provide a white emission. Similarly, there is no suggestion to motivate one of skill in the art to modify the teaching of Bogner to replace the LED with a blue and/or blue-green emitting electroluminescent phosphor and corresponding electric field source to stimulate such an electroluminescent phosphor. Similarly, there is no suggestion to motivate one of skill in the art to modify Lee by creating a phosphor blend with a blue and/or blue-green emitting electroluminescent phosphor. Thus, this rejection should be withdrawn.

### **CONCLUSION**

In view of the foregoing Remarks, Applicants respectfully submit that the rejections have been overcome and that claims 1-28 are in condition for allowance. Applicants earnestly seek notification of same.

Applicants request a telephonic interview with Examiner prior to the issuance of an Office Action in this matter.

A credit card payment submitted via EFS Web authorizing payment in the amount of \$3,160.00, representing \$810.00 for the fee under 37 C.F.R. § 1.17(e) and \$2,350.00 for the fee under 37 C.F.R. § 1.17(a)(5). This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

**ATTORNEY DOCKET NO. 07194.0113U1**  
**APPLICATION NO: 10/711,682**

Respectfully submitted,

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